REMARKS

Receipt of the final rejection mailed October 25, 2006 is acknowledged. All pending claims (claims 1, 4-6, 9-11, 14-30, 74-89, and 90-110) stand rejected under 35 USC Section 101. Claims 31-43 and 64-72 are withdrawn. According to the action, the claimed invention does not produce a "useful, concrete and tangible result" as mandated by *State Street Bank*. Further, the action states that the coding data container recited in claims 1, 4-6, 9 and 10, is not functionally related to hardware and software elements of a computer system such that an output result is produced. Thus, according to the action, the claimed invention is non-statutory. The action applies the same basic logic to claims 11, 14-30, 74-89, and 90-110. In keeping with the foregoing amendments and the following argument, reconsideration and allowance is respectfully requested.

Claim 1 has been amended and now positively recites, in part, for each input list of a plurality of integer lists, executing a routine on a processor of the computer system for producing an output comprising coding data. The coding data includes, for each subset containing at least one integer of the input list, the rank of said subset in the pattern and a bitmap segment in which each bit is associated with a respective integer of the subset to indicate whether said integer belongs to the input list. Claim 1 further recites storing the coding data in a computer memory coupled to a processor, with the coding data stored in a coding data container comprising records stored in a computer readable medium and having respective addresses. Each record of the coding data container includes a first field for storing an integer rank related to the pattern, a second field for storing an address value for another record of the data container and a third field for storing a bitmap segment.

Consequently, amended claim 1 now positively recites a functional relationship between the hardware and software elements a computer system, and also positively recites an output result. Claim 1 executes a routine on the processor of the computer system, outputs the coding data produced as a result of the routine, and stores the coding data in a computer memory. Accordingly, claim 1 is now directed toward statutory subject matter and is therefore in allowable form.

Furthermore, because the office action cites *State Street Bank & Trust v. Signature Financial Group*, 149 F.3d 1368 (Fed. Cir. 1998), a more detailed look at that case is very informative. In *State Street Bank*, the Federal Circuit discussed a number of prior cases, all

of which, according to the Federal Circuit, produced the requisite "useful, concrete and tangible result. For example, referring to the *Alappat* case, the Federal Circuit noted:

> data, transformed by a machine through a series of mathematical calculations to produce a smooth waveform display on a rasterizer monitor, constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it produced 'a useful, concrete and tangible result' -- the smooth waveform.

Id. (citations omitted).

Further, referring to the *Arrhythmia Research Technology* case, the Federal Circuit noted:

> the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete or tangible thing -- the condition of a patient's heart.

Id. (citations omitted).

Finally, in *State Street Bank* itself, the court held that:

> the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades

Id.

According to the latest revision to Section 2106-II of the MPEP, available online at http://www.uspto.gov/web/offices/pac/mpep/mpep.htm, when determining whether a process such as what is claimed in the present application is statutory, what is determinative is not how the computer performs the process, but what the computer does to achieve a practical application. See also *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036. The same revision of the MPEP gives helpful examples of what amounts to statutory inventions computer-related process claims:

- A computerized method of optimally controlling transfer, storage and retrieval of data between cache and hard disk storage devices such that the most frequently used data is readily available

- A method of controlling parallel processors to accomplish multi-tasking of several computing tasks to maximize computing efficiency. See, e.g., In re Bernhart, 417 F.2d 1395, 1400, 163 USPQ 611,616 (CCPA 1969)
- A method of making a word processor by storing an executable word processing application program in a general purpose digital computer's memory, and executing the stored program to impart word processing functionality to the general purpose digital computer by changing the state of the computer's arithmetic logic unit when program instructions of the word processing program are executed.
- A digital filtering process for removing noise from a digital signal comprising the steps of calculating a mathematical algorithm to produce a correction signal and subtracting the correction signal from the digital signal to remove the noise.

See MPEP Section 2106-IV(B)(2)(b), January 2007 revision, available online at http://www.uspto.gov/web/offices/pac/mpep/mpep.htm.

The present specification is replete with examples discussing not only how the computer performs the process, but what the computer does to achieve a practical application. As pointed out in prior responses, the output produced by the claimed invention results in a computer program product that provides efficient physical access to the storage medium when performing various manipulations of input integer lists in a computer system. By way of further example rather than limitation, the specification discusses the practical application of applying the claimed method in the context of database query processing. Producing, outputting and storing the coding data, based on the input integer lists, permits more efficient access to the underlying data stored on the integer lists. This is a "useful, concrete and tangible result" of the type contemplated in *State Street Bank*, contemplated in the cases cited in *State Street bank*, and contemplated by the exemplary situations articulated in the MPEP. Consequently, claim 1 is in allowable form.

Claim 11 has been amended to positively recite, in part, that each coding layer comprises the following steps executed as a routine on a processor of the computer system for processing an input list of integers within the respective integer range, the steps producing coding data including, for each subset containing at least one integer of the input list, data representing the position of each integer of the input list within said subset and, at least if said layer is the last coding layer, data representing the position of said subset in the pattern, storing the coding data in a computer readable medium operatively coupled to a processor of the computer system, and if said layer is not the last coding layer, forming a further integer list representing the position, in the pattern of said layer, of each subset containing at least one integer of the input list, and providing said further integer list as an input list of the next

layer. Applying the above arguments from claim 1 to claim 11, claim 11 is now in allowable form.

The remaining independent claims have been amended in a similar manner. Specifically, claims 74, 77 and 90 recite, in part, storing coding data in a computer readable medium operatively coupled to the processor of the computer system, while claims 95 and 98 recite a computer program product that comprises instructions for storing the coding data in a computer readable medium operatively couplable to the processor of the computer system. All of these independent claims are statutory for the same reasons outlined above with respect to claims 1 and 11. Accordingly, the Section 101 rejection is overcome for all pending non-withdrawn claims.

CONCLUSION

It is respectfully submitted that the present response overcomes all the rejections made in the outstanding office action. The application is believed to be in condition for allowance.

Prompt allowance of the application is respectfully requested.

Respectfully submitted,

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